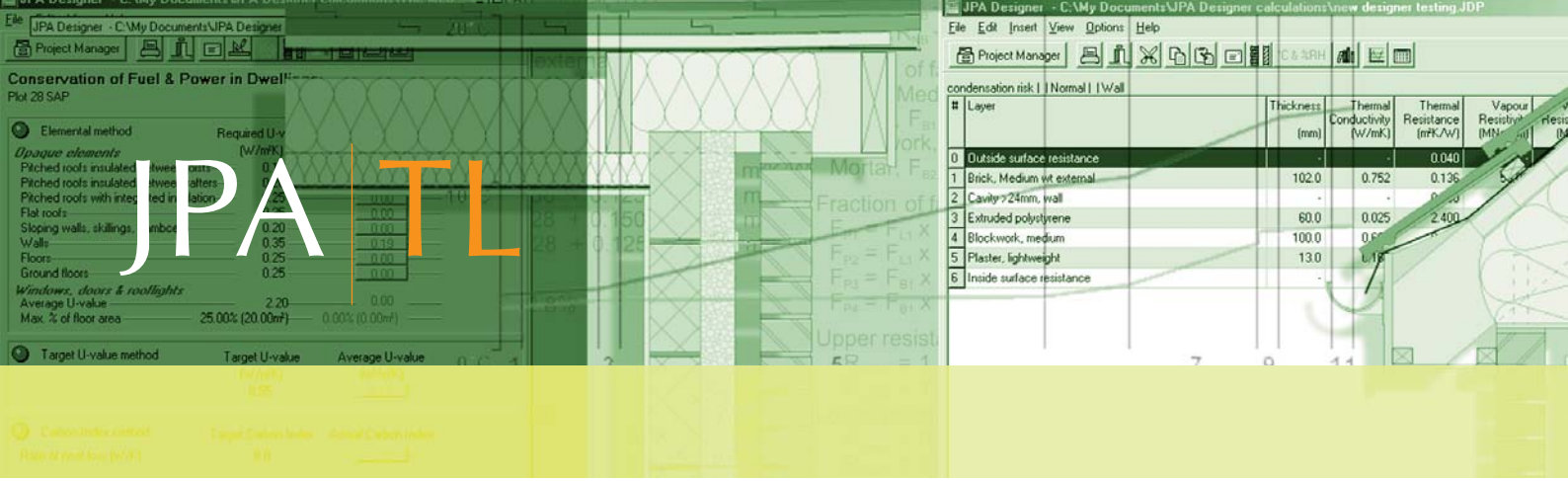


# JPA Designer

## Solar Panel and Wind Turbine Payback Calculation Module

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# 1 Introducing the JPA Designer payback module

This manual explains how to use **JPA Designer** to carry out solar panel and wind turbine payback calculations for the Feed-In Tariff (FIT).

The payback module in JPA Designer use the methods in SAP 2009 to determine the amount of electricity generated by photovoltaic panels and small-scale wind turbines[1].

The module then estimates the payback period for the installation, taking account of:

- the initial cost of the installation and the interest on any loan;
- the income from the feed-in tariff;
- savings on electricity bills;
- income from sale of electricity to the grid;
- general inflation (which affects the FIT rate) and energy price inflation.

The *Quick Start* guide in the next section takes you through the main steps in installing the program and carrying out a basic payback calculation. The rest of the manual contains in-depth information to help you get the most out of the software.

We hope you find JPA Designer a useful calculation tool. We are always happy to receive comments, suggestions for improvements or new features.

## 1.1 Quick start

This section guides you through the main steps of the payback calculation and tells you where can find more information on each of those steps later on in the manual.

The first thing to do is to install and register the program:

1. Download and install JPA Designer (see chapter 2).

[1] The generation figure based on SAP 2009 is an estimated value. As the MCS disclaimer states: the performance of solar PV systems is impossible to predict with certainty due to the variability in the amount of solar radiation (sunlight) from location to location and from year to year. This estimate is baed on the Government's standard assessment procedure for energy rating of buildings (SAP) and is given as guidance only. It should not be considered as a guarantee of performance.

2. Select JPA Designer from the **Start** button (see section 2.7). The program opens.
3. On the toolbar click **Edit User & Security Codes**. This opens the **User Registration** dialogue box (see section 2.4).
4. In the **PV product details** area, in the **Your company name** box, enter the user name you received in your registration email.
5. Now copy the twenty character code from the email and paste it into the text box next to the **Apply** buttons. Click **Apply PV key code**. The code is copied into the **PV key code** boxes. Click **OK**.

Now you can start a payback calculation:

1. On the **Insert** menu, click **Solar Panel & Wind Turbine payback calculation**.
2. On the **Description** dialogue box click **OK**. The program adds a new payback calculation to the list, named **Solar Payback 1**.
3. In the **Program Manager** window, double click on **Solar Payback 1**. The **Payback** window opens (see chapter 4).
4. On the **Edit** menu, click **Solar Panel & Wind Turbine details**. The **Solar Panel & Wind Turbines** dialogue box opens (see section 4.2).
5. In the *Photovoltaics* section, on the first row (row 1) set
   - **Peak kW** to *4*.
   - **Pitch** to *30°*.
   - **Direction** to *South*.
   - **Overshading** to *None or very little*.
6. In the *Costs* section, set the **Total installed costs of system** to 10000.
7. Click **OK**.
8. The **Payback** window now shows the PV output, the income and savings figures and the payback period. The *Payback graph* and the *Electricity generation* graph show payback periods and monthly generation figures.

And that's it: a completed payback calculation. If you want to, you can print the results of this calculation (see section 4.4):

1. On the toolbar, click **Print**.
2. The **Print preview** opens. You can move through the preview using the arrow keys at the top of the window to move between pages and the scroll bar to the side to move up and down the pages.
3. When you are satisfied with the results, click the **Print** button.

# 2 Getting started

This section of the manual describes how to install JPA Designer on your PC and explains how the user registration and on-line licence checking systems work. It also includes instructions on updating your copy of JPA Designer.

## 2.1 Getting help

This manual uses the following conventions:

- <angled brackets> for keys on the computer keyboard, e.g. the <Enter> key.
- the **+** sign indicates you should hold down one key while pressing another, e.g. <Alt+F> means 'hold down the <Alt> key while pressing the <F> key'.
- **Bold type** indicates parts of JPA Designer's screen displays, e.g. the **Solar Panels and Wind Turbines** dialogue box.
- **Menu**>**option** indicates the option in the menu on the program's menu bar, e.g. Select **Edit**>**Primary heating system** means *select the* ***Primary heating system*** *option from the* ***Edit*** *menu*.

This manual uses the following special terms:

- **dialogue box**: a small window which displays boxes or buttons for entering data.
- **Option button**: a set of round buttons. You can only select one at a time.
- **Tick box**: a box which shows whether or not a particular setting is on (ticked) or off (not ticked).
- **Text box**: an area on a dialogue box in which you can type words or numbers.
- **List**: a box which can be expanded to show a number of pre-set options, usually by clicking an arrow on the right-hand side of the box.

If you have a problem with the *functioning* of the software please follow these steps:

- Download and install the latest version of JPA Designer from our web site (section 2.3 for instructions) and see if that resolves the problem.

- Check the forum and FAQ on our web site (http://forum.techlit.co.uk) to see if the problem is addressed there.
- If the problem persists, email details of the problem to *support@techlit.co.uk*. Please include details of your computer system and attach sample files or PDF outputs where possible. We will respond as soon as we can.

## 2.2 System requirements

JPA Designer requires a PC running Windows XP or later. JPA Designer can run on Intel-based Apple Macintosh computers using virtualisation software (such as Parallels or VMWare), or through Bootcamp. However, we do not guarantee the program will run on such systems, nor do we offer technical support.

The computer must have an internet connection to enable the program to check the validity of your licence whenever it starts.

## 2.3 Installation

To install JPA Designer on your PC:

1. Go to our web site at www.techlit.co.uk and right click on **Download JPA Designer**: select **Save link as** (for Firefox) or **Save target as** (for Internet Explorer).
2. Download the installer file **jsetup990.exe** to your PC (we recommend downloading the file to the Desktop). The download is about 12 MB.
3. Double click on the file **jsetup990.exe**. After a few moments the InstallShield Wizard opens.

   *You may see a security warning that the publisher of the file could not be identified. If you do, click **Run** to continue the installation process.*
4. Click **Next** to continue with installation. The installer displays the **Licence Agreement**. To continue with the installation click **I accept the terms of the licence agreement**, then click **Next**.
5. At the **Customer information** screen enter your name and company name. Use the options buttons to select whether you want JPA Designer to be available to all user accounts on the computer, or just one. (We recommend you select *all*.) Click **Next**.
6. At the **Choose Destination Location** screen we recommend you accept the default settings and install JPA Designer into the folder **c:\program files\jpatl\jpa designer 981**. Click **Next**. The installer will now copy the JPA Designer files onto your computer.
7. When installation has finished the **Setup Complete** screen is displayed. Tick **Launch the program** and click **Finish**. The installer will close and **JPA Designer** will open, showing you the **Project Manager** window.

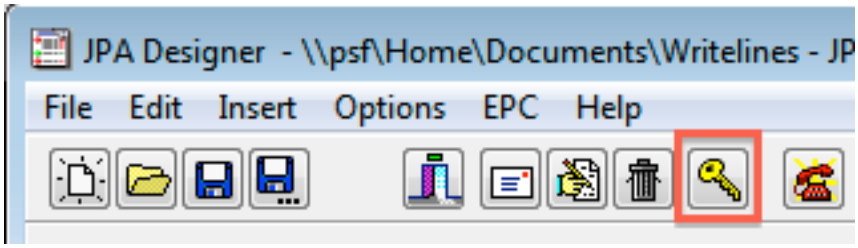



Figure 2.1: The Edit User & security codes button

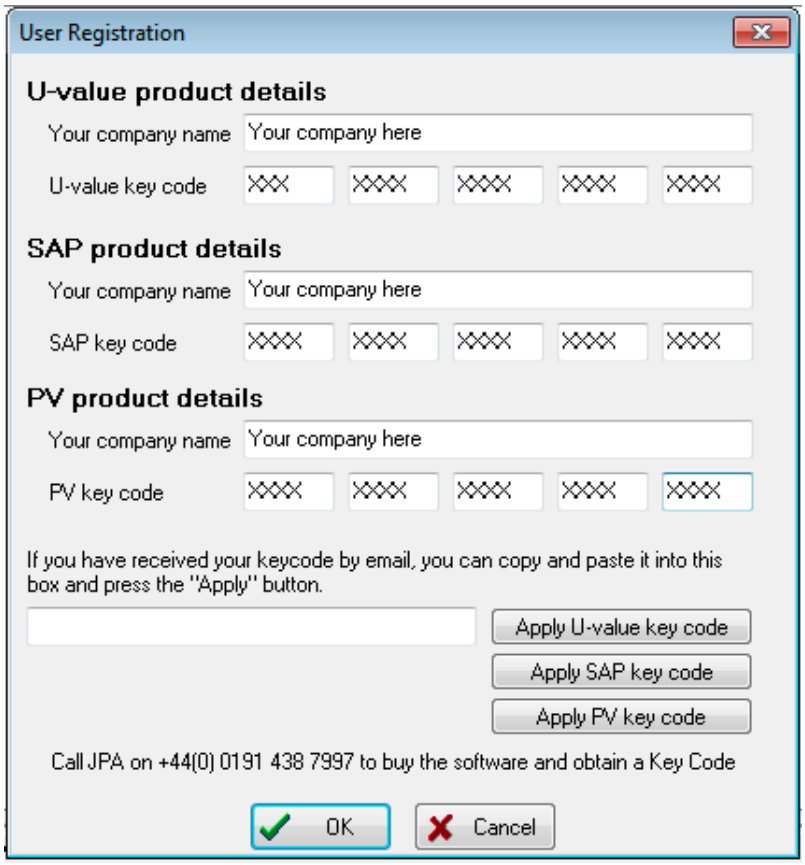

User Registration
U-value product details
Your company name
Your company here
U-value key code
XXX
XXXX
SAP product details
Your company name
Your company here
SAP key code
PV product details
Your company name
Your company here
PV key code
If you have received your keycode by email, you can copy and paste it into this box and press the "Apply" button.
Apply U-value key code
Apply SAP key code
Apply PV key code
Call JPA on +44(0) 0191 438 7997 to buy the software and obtain a Key Code
OK
Cancel

Figure 2.2: The User Registration dialogue box

## 2.4 User registration

When you first install JPA Designer the program runs in *demonstration mode* and does not display the results of calculations. You must unlock the program with your key code to access the full functionality of the software.

To enter the key code for a *PV and Wind Turbines* licence:

1. On the toolbar, click **User & security codes** (Figure 2.1).
2. Copy the user name from the registration email. In the **PV product details** area, paste the user name in the **Your company name** box. (Figure 2.2).
3. Copy the *key code* from the registration email and paste it into the box at the bottom of the **User Registration** dialogue box.

4. Click **Apply PV key code**. The program will now paste the code into the **U-value key code** boxes.
5. Click **OK**. The software is now unlocked

## 2.5 On-line licence checking

JPA Designer will try to check the the validity of your licence against our on-line licensing database the first time you open a PV calculation after starting the program.

- If the check is successful and the licence is valid the module will open (the program will record the date and time of that successful check).
- If the check is successful and the licence is not valid the calculation will not open.
- If the program is unable to connect with the database (for example, because you are using your lap-top away from your office) it will look at the date of the last successful check: if that is less than seven days ago then it will open the module.
- If the program is unable to connect with the database and the last successful check is more than seven days ago then it will **not** open the module.

If you often use JPA Designer away from the office you can use the **Check licence on-line** button on the tool bar will force a licence check and re-set the time since the last check to zero. You should force a check if you expect not to have an internet connection for a few days.

## 2.6 Updates

JPA Designer is continually being developed to introduce new features: to get the best from the program it is worth making sure you are using the latest version. To check whether there is a later version available you should compare the version number shown on our web site (www.techlit.co.uk) with that of the program you are using. On the **Help** menu, click **About** to see the version number.
Higher numbers and letters indicate later releases, with characters coming earlier in the name being more important that later ones: so 4.05a1 will be more recent than 4.04c2, and 4.05b1 more recent than 4.04a4. The three digit *Build* number indicates a minor change in a version. Figure 2.3 shows the **About** message for JPA Designer together with the version number on the web site: in this case the software is up to date, as both version numbers are the same.
The process for updating the software is identical to that of originally installing it, but with the additional step of **uninstalling** your current version of JPA Designer before installing the new version.
To update JPA Designer:

1. Use the Windows **Add/Remove Programs** or **Uninstall programs** control panel to uninstall the current version of JPA Designer.

   *Uninstalling the current version will not affect your calculation files.*

2. Download and install the new version of JPA Designer following the instructions in section 2.3.

Figure 2.3: The version number in the About dialogue box shown over the web site

## 2.7 Starting JPA Designer

To start JPA Designer:

- Click **Start**, and then point to **All programs**. Click **JPA Designer**, then click **JPA Designer EPC SAP 9.81**.

To close JPA Designer:

- On the **File** menu, click **Exit**. The program will prompt you to close any files which have not been saved.

## 2.8 Uninstalling JPA Designer

To uninstall JPA Designer:

1. Click **Start**, then click **Control Panel**.
2. In Control Panel, double-click **Uninstall a program**.
3. In the list of programs, double-click **JPA Designer**.
4. At the message *Are you sure you want to uninstall JPA Designer 9.90*, click **Yes**.
5. The program is uninstalled.
   *That will not remove any JPA Designer project files.*

# 3 Managing projects and calculations

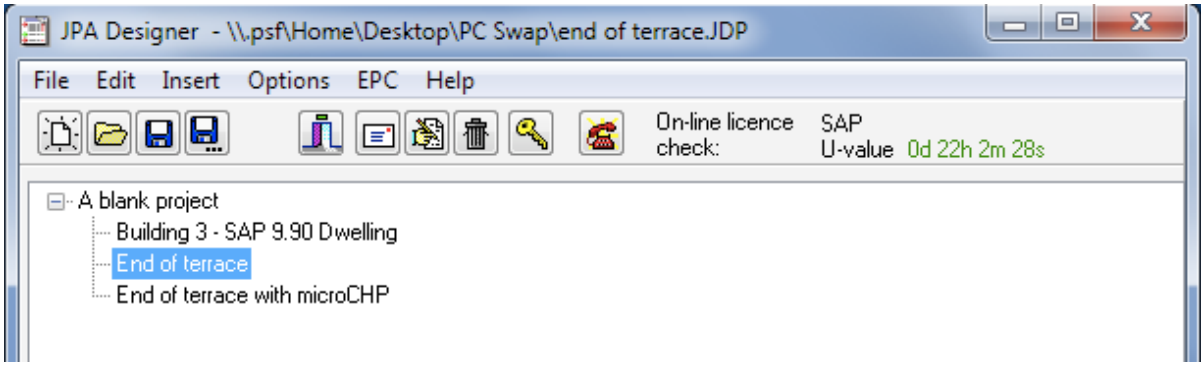

JPA Designer - \\.psf\Home\Desktop\PC Swap\end of terrace.JDP
File Edit Insert Options EPC Help
On-line licence check:
SAP U-value 0d 22h 2m 28s
A blank project
Building 3 - SAP 9.90 Dwelling
End of terrace
End of terrace with microCHP

Figure 3.1: The Project Manager window show the calculations in a project

JPA Designer organises and saves calculations in project files, which have the extension **JDP**. You can save a number of PV calculations in the same file.

You can create, save and manage calculations in the JPA Designer **Project Manager** window (Figure 3.1), which lists all the calculations in the current project.

## 3.1 Starting a new project

Whenever you start JPA Designer the program creates a new blank project which you can start using straight away. You can also create a new project at any time.

To create a new project:

- On the **File** menu, click **New Project**.

You can change the default project name **A blank project** to something more useful:

1. Click on the project name, then on the **Edit** menu click **Rename selected item**.
2. In the **Project name** dialogue box (Figure 3.6) type the new name for your project.
   *The project name does not affect the calculations in any way.*

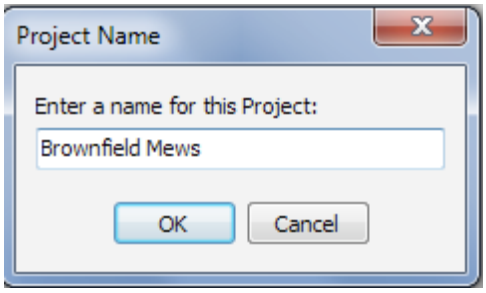



Figure 3.2: Changing the name of a project

## 3.2 Adding project address details

JPA Designer can store client and site details for a project, which you can then copy to all the individual calculations within that project. You can enter and edit that information using the **Project Address** dialogue box (Figure 3.3). You can also save client information to reuse it later.

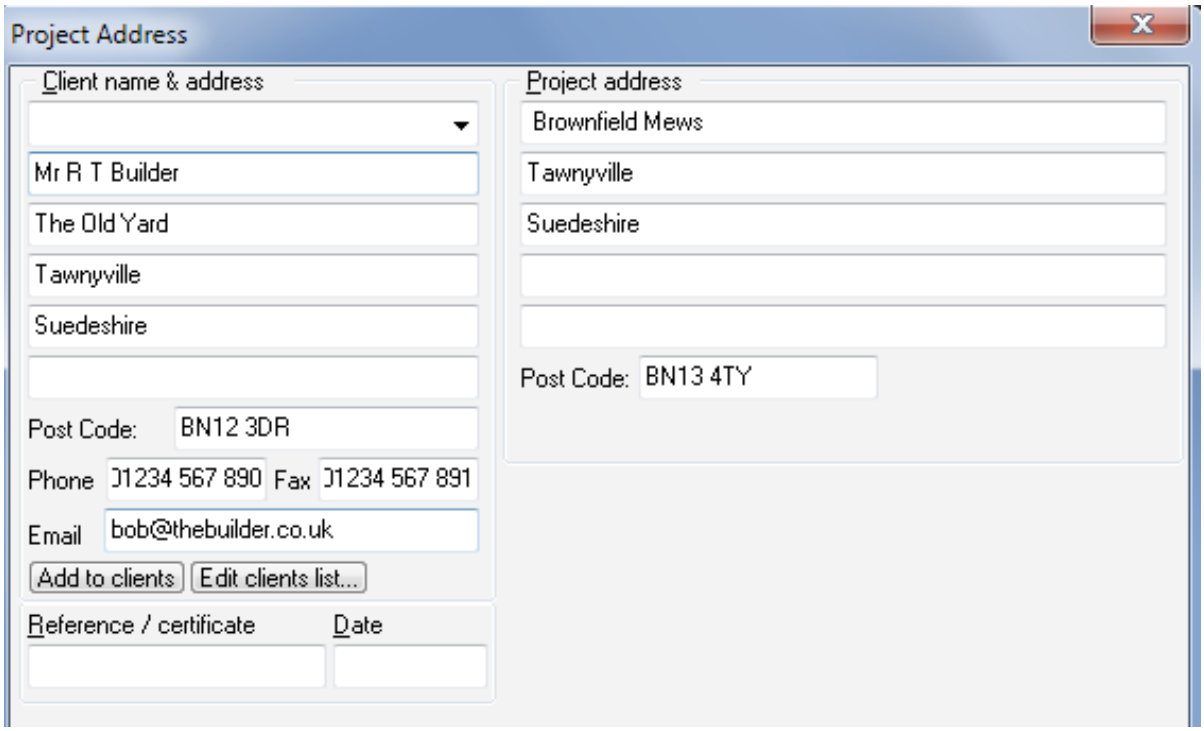



Figure 3.3: The Project Address dialogue box

To add or change project information:

1. On the **Edit** menu, click **Project Address**.
2. In the **Project Address** dialogue box, enter the data by typing it into the appropriate boxes. Use the <Tab> key to move between boxes.

   *Do not try to enter data in the top left hand box: this box is used for retrieving details you have previously stored.*
3. If you want to store the client details to re-use later, click **Add to clients**.

To re-use existing client data simply click on the drop-down in the **Project information** dialogue box and select a client from the list (Figure 3.4).

If you need to edit the stored details click **Edit clients list** then make the changes in the **Edit Clients** dialogue box.

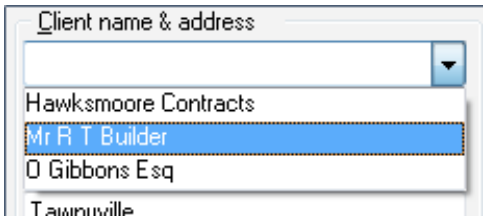



Figure 3.4: The client name and address drop-down

## 3.3 Saving projects

JPA Designer project are saved in the same way as any other file:

1. On the **File** menu, click **Save Project**.
2. In the **Save As** dialogue box, select the folder into which the project should be saved. Enter a name for the project file.

   *By default JPA Designer will add the extension **JDP** to all file names.*
3. Click **Save**. JPA Designer saves the project and displays the file name on the program title bar.

By default JPA Designer will save files into the JPA Designer folder (usually *c:\Program Files\JPATL\JPA Designer 981*). You can specify a different default folder using the **Options** dialogue box (see section 3.10).

We recommend you have a daily back-up schedule for your data.

## 3.4 Opening projects

To open an existing project:

1. From the **File** menu, click **Open project**.
2. In the **Open** dialogue box, click the file you want to work with. Click **Open**.
3. The project opens in the **Project Manager** window.

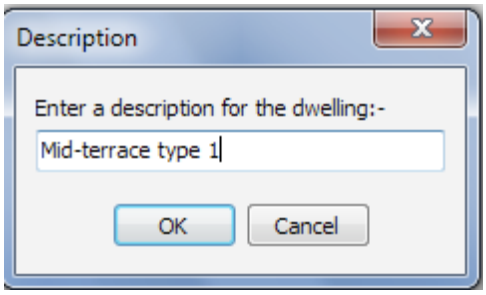



Figure 3.5: The Description dialogue box

## 3.5 Adding calculations to a project

You can add new PV calculations to a project in the **Project Manager** window.

To add a new U-value calculation to a project:

1. On the **Insert** menu, click **Solar Panel & Wind Turbine payback calculation**.
2. In **Description** dialogue box (Figure 3.5) type a name for the calculation, e.g. *23 New Row*.
3. The new calculation is added to the project.

## 3.6 Opening and closing calculations

To open an existing payback calculation in the **Project Manager** window, either:

- double-click on the calculation name; or,
- click on the calculation name, then on the **Edit** menu, click **Edit selected item**.

To close a calculation and return to the **Project manager** window, on the toolbar, click **Project manager**.

## 3.7 Duplicating calculations

If you want to prepare a calculation which is very similar to an existing calculation in a project you can duplicate the calculation and then make your changes to the copy, without affecting the original calculation. To duplicate a calculation:

1. In the **Project Manager** window click on the calculation.
2. On the **Edit** menu, select **Edit**>**Duplicate item**. The **Description** dialogue box opens.
3. Type a name for the duplicate calculation.
4. A copy of the original calculation is added to the project. You can now work with the duplicate calculation in the usual way without altering the original.

## 3.8 Renaming calculations and projects

To change the name of a calculation:

1. In the **Project Manager** window click on the calculation.
2. On the **Edit** menu, click **Rename selected item**.
3. In the **Name** dialogue box, enter a new name for the calculation.
4. The **Project Manager** window shows the new name.

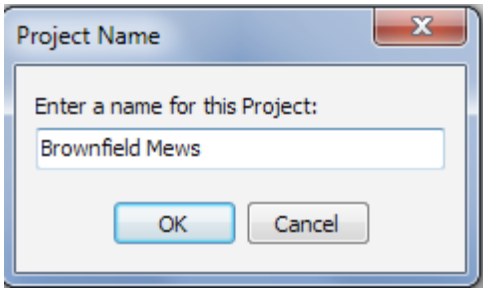



Figure 3.6: Changing the name of a project

You can change the default project title **A blank project** to something more useful in exactly the same way.

Changing the name of a calculation or project will not affect the calculation results.

## 3.9 Deleting calculations

You can delete calculations from JPA Designer projects.

**WARNING: there is no way of recovering a deleted calculation.**

To delete a calculation:

1. In the **Project Manager** window click on the calculation.
2. On the **Edit** menu, click **Delete selected item**.
3. At the confirmation message *Are you sure you want to delete the selected item*, click **Yes**.
4. The calculation is removed from the project.

## 3.10 Program options

You can customise the performance and outputs of JPA Designer in many ways. Most of the options are controlled from the **Options** dialogue box.

To open the **Options** dialogue box:

- Click the **Options** menu.

The **Options** dialogue box box has four tabs:

**General**:

- **Printer margins**: changes the page margins for printing.

  *If you are using headed paper you can set the top margin for the first page to be greater than that of the second page, which can be printed on continuation paper or blank paper.*

- **Company name and address**: the details you enter here are used on print-outs of payback calculations.
- **Options**: use these check boxes to select which items which should appear on the print-outs and to make back-up copies of JDP project files.
- **Start-up folder**: sets the default folder for saving and opening project files.
- **Check for programme updates**: lets you specify whether or not the software will check for updated versions of JPA Designer. For more information see section 2.6.

The other items on this tab do not affect payback calculations.

**Logo and signature:**

- **Logo position**: you can include your company logo on print-outs. Use these settings to determine the position of the logo. The logo file must be a 256 colour bitmap with the file extension BMP, and it must be in the JPA Designer folder. Enter the name of the file in the text box, but do not include the path (e.g. enter *logo.bmp* not *c:\Program files\JPATL\JPA Designer 981\logo.bmp*).
- **Address position**: These settings determine the position of your company address on print outs and PDFs. Enter the address itself in the **General** tab.

You can ignore the *Certificate signature position* and the *TIMSA logo position* options: they do not affect payback calculations.

**Email:**

There are no options for payback calculations on this tab.

**Other:**

There are no options for payback calculations on this tab.

# 4 Payback calculations

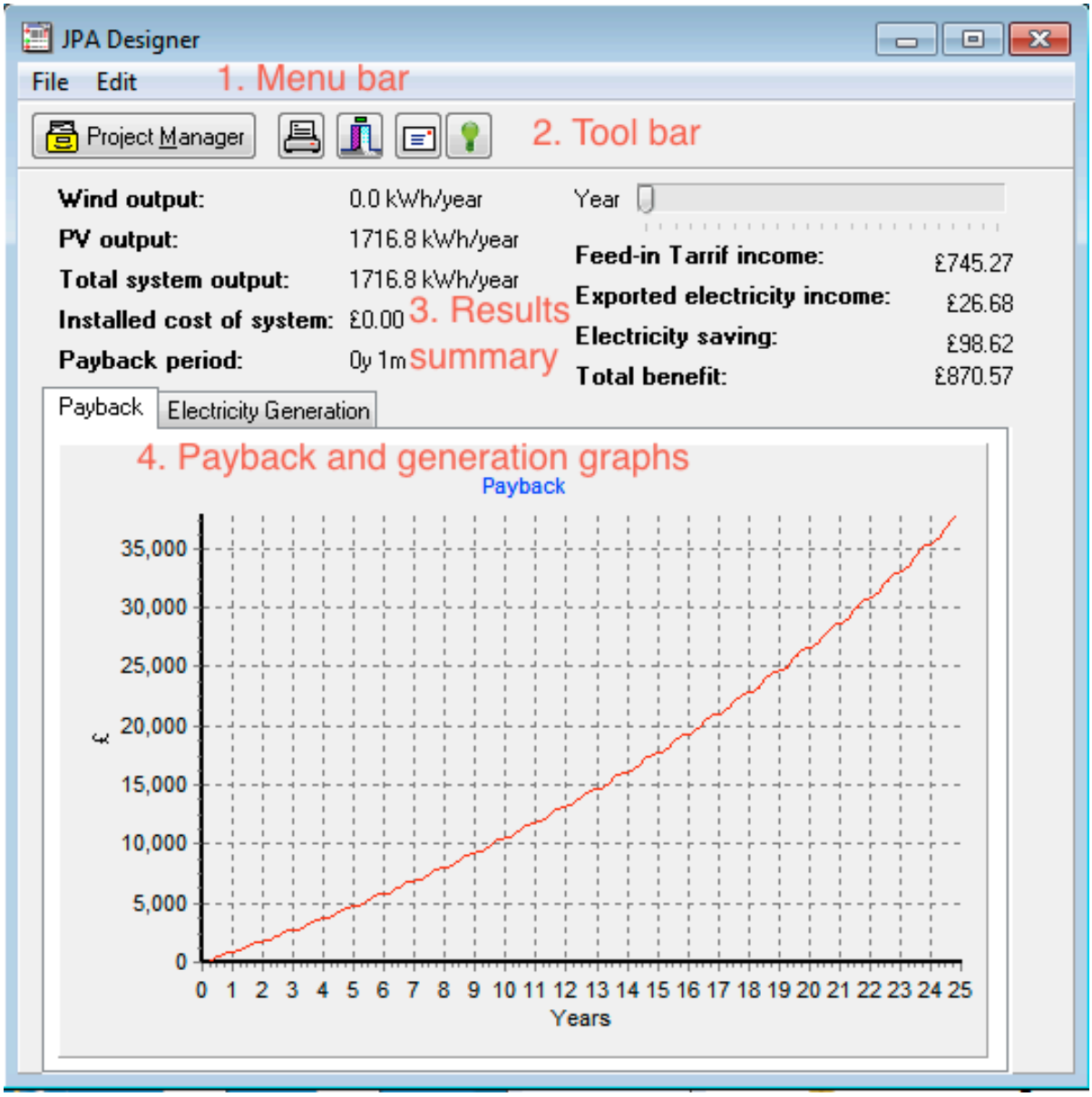



Figure 4.1: The Payback window

Payback calculations are carried out from the **Payback** window (Figure 4.1), which consists of:

1. The **Menu**.
2. The **Toolbar**.
3. The results summary.
4. The payback and generation graphs.

There are five main steps to carrying out a payback calculation:

1. Create and open a new payback calculation (see section 3.5 and section 3.6).
2. Set the project information (section 4.1).
3. Enter the PV panel and turbine data, together with the financial assumptions (section 4.2).
4. Review the results (section 4.3). If necessary you can revise the
5. Print the results (section 4.4).

## 4.1 Project information

You can enter client and location details for the project which will appear on the pay-back calculation print-outs.

To add client and location details:

1. On the **Edit** menu, click **Project Information**.
2. In the **Project Information** dialogue box enter client and project details by typing it into the appropriate boxes. Use the <Tab> key to move between boxes.

Alternatively, you can copy client and project details which you entered in the **Project Information** dialogue box in the **Project Manager** window.

To copy client and project details from Project Manager:

1. On the **Edit** menu, click **Project Information**.
2. In the **Project Information** dialogue box, click **Inherit**. Any information you entered in **Project Manager** is copied to the **Project Information** dialogue box.

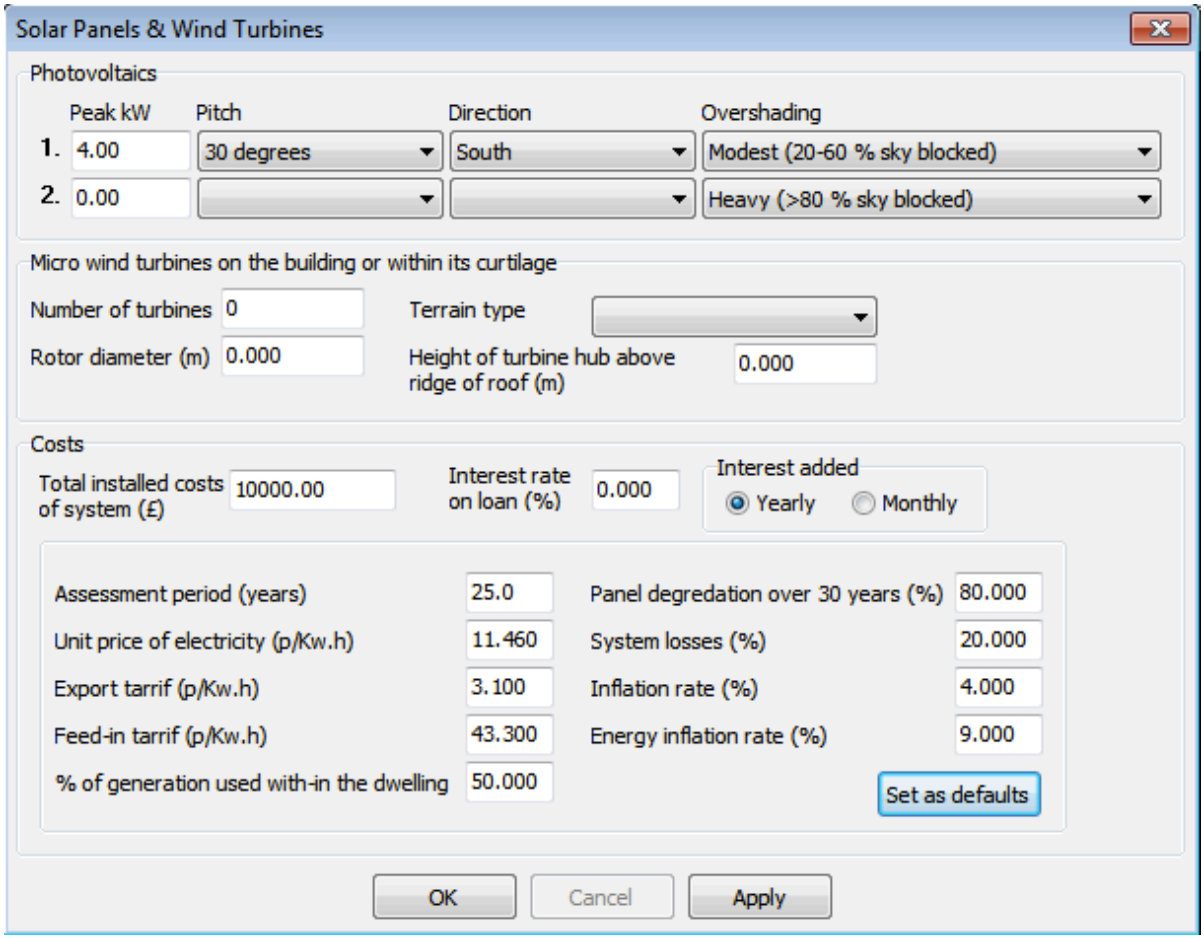



Figure 4.2: The Solar Panels & Wind Turbines dialogue box

## 4.2 Solar panels and wind turbines

The input data for the photovoltaic panels and wind turbines are entered in the **Solar Panels & Wind Turbines** dialogue box.

To open the dialogue box:

- on the toolbar, click **Solar Panel & Wind Turbine details**: or,
- on the **Edit** menu click **Solar Panel & Wind Turbine details**.

The **Solar Panels & Wind Turbines** dialogue box (Figure 4.2) has three sections:

- Photovoltaics;
- Micro wind turbines;
- Costs.

At the bottom of the dialogue box are three buttons:

- To accept the input data and close the dialogue box, click **OK**.

- To accept all the input data in the dialogue box but keeps the dialogue box open, click **Apply**. This makes it easy to see how changes to the input data affect the calculation results and then make further changes.
- To discard the input data in the dialogue box and close the dialogue box, click **Cancel**.

## Photovoltaics

To assess the benefits of installing photovoltaic panels on the dwelling you must enter the follow data about the panels:

- The **Peak kW** of the system, which you can calculate by multiplying the peak kW of the individual panels by the number of panels.
- The **Pitch** of the panels.
- The **Direction** which the panels face.
- The amount of **Overshading** from trees or adjacent buildings.

You can specify two different photovoltaic installations for the same dwelling, to allow for situations where panels are installed on different roof slopes.

## Wind turbines

To assess the benefits of installing one or more wind turbines on the dwelling or within its curtilage[1] you must enter the following data about the turbines:

- the **Number of turbines**.
- the **Rotor diameter**, measured in metres.
- the type of **terrain** which surrounds the dwelling, which will be either *Dense urban*, *Low rise urban/suburban* or *rural*.
- the **height** of the hub of the turbine above the ridge of the roof, in metres.

## Costs

To assess the overall costs and benefits of the panels and/or turbines you must complete the *Costs* area of the dialogue box. The first row is for the cost of the installation:

- **Total installed costs**: how much will the photovoltaic panels and turbines cost to install.
- **Interest rate on loan**: if the client will be taking out a loan to pay for the installation enter the interest rate here. If there is no loan leave this box at zero.

[1] An area of land attached to a house and forming one enclosure with it.

- **Interest added**: determines if the interest on the loan is added on a *yearly* or *monthly* basis. Adding interest on a monthly basis will increase the payback period.

The rest of the *Costs* section is for the data used in the payback calculation:

- **Assessment period**: the length of time of the assessment, in years. This is generally set at 25 years, which is the duration of the feed-in tariff.
- **Unit price of electricity**: the price in pence per kWh at the time of calculation.
- **Export tariff**: the amount paid by the electricity supplier for energy generated by the system and exported to the grid, in pence per kWh.
- **Feed-in tariff**: the amount paid by government for each unit of electricity generated by the system, whether used within the dwelling or exported, in pence per kWh.
- The **percentage of generation used within the dwelling**. Electricity generated and used within the dwelling reduces the use of grid electricity. Electricity generated but exported only attracts the lower generation payment. Consequently, the greater the proportion of electricity used within the dwelling, the more benefit is derived from the panels or turbines.
- **Panel degradation**: this represents the loss of performance of the solar panels over the assessment period. A common presumption is that at the end of a thirty year period the panels will have only 80% of their initial performance.
- **System losses**: a proportion of the electricity generated is lost through conversion from the direct current (DC) produced by the panels to alternating current (AC) used within the dwelling and by the grid. 20% is a commonly used proportion.
- **Inflation rate**: the annual rate of inflation, which is used to adjust the feed-in tariff rate, generally set at 4%.
- **Energy inflation rate**: the annual rate of inflation for energy costs, which is used to adjust the unit price of electricity when determining savings, generally set at 9%.

You can change the default values built into the program by setting the items from the **Assessment period** to the **Energy inflation rate** to the values you want to use then clicking **Set as defaults**. The next time you start a calculation the program will show your values.

## 4.3 Payback results

Once you have entered the panel, turbine and financial data, JPA Designer shows the estimated electrical output of the system and the financial returns. The results summary (section 3 of the **Payback** window in Figure 4.1), shows:

- the annual electrical output of any wind turbines;
- the annual electrical output of any PV panels;
- the total annual electrical output of the system;

- the installed cost of the system;
- the estimated payback period in years and months.

The right hand side of the results summary shows the benefit of generation for single year during the assessment. You can set the year using the **Year** slider, and the program shows:

- the **Feed-In Tariff income** from all the electricity generated;
- the **income from exported electricity**, that is, electricity generated by the system but not used within the dwelling);
- the **electricity saving** which comes from using generated electricity in the dwelling;
- the **total benefit** which is the sum of those three items.

As you move the slider the right and view later years you will see the annual income and benefits increase as a result of general inflation and energy cost inflation.

Below the numerical results are two graphs:

- the **Payback** graph shows the cumulative benefit of the system over the assessment period. The payback line starts at a negative number, which is the installation cost. The point at which the payback line crosses zero on the y-axis is the break-even point.
- the **Electricity generation** graph shows the amount of electricity generated for each month of the year.

You can switch between graphs by clicking the **Payback** and **Electricity generation** tabs.

## 4.4 Outputting payback results

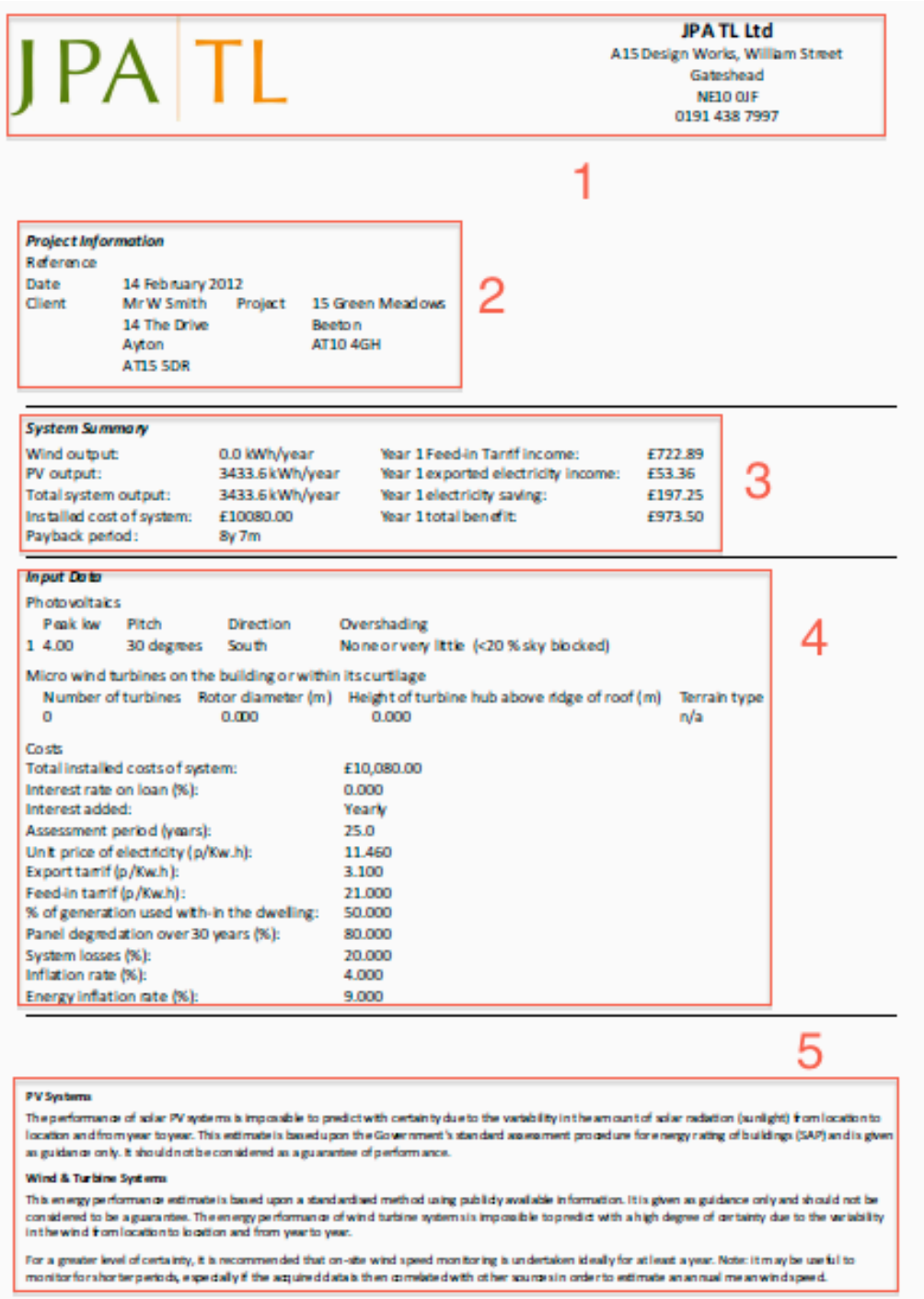
You can print the results of payback calculations in order to give them to a potential client.

To print results:

1. On the toolbar, click the **Print** button.
2. The **Print Preview** window opens, showing a draft quality preview of the print-out. Use the the scroll bar on the right to move up and down individual pages, and the arrow buttons at the top left of the window to move between pages.
3. If you are happy with the preview click **Print**.

The print-out consists of three pages:

- Page 1: Summarises the inputs and results (an example is shown in Figure 4.3):
    1. Your logo and address details.
    2. The client and project details.



JPA TL

JPA TL Ltd
A15 Design Works, William Street
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NE10 0JF
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1

***Project Information***

Reference
Date 14 February 2012
Client Mr W Smith
14 The Drive
Ayton
AT15 5DR
Project 15 Green Meadows
Beeton
AT10 4GH

2

***System Summary***

| | | | |
|---|---|---|---|
| Wind output: | 0.0 kWh/year | Year 1 Feed-in Tariff income: | £722.89 |
| PV output: | 3433.6 kWh/year | Year 1 exported electricity income: | £53.36 |
| Total system output: | 3433.6 kWh/year | Year 1 electricity saving: | £197.25 |
| Installed cost of system: | £10080.00 | Year 1 total benefit: | £973.50 |
| Payback period: | 8y 7m | | |

3

***Input Data***

Photovoltaics

| | Peak kw | Pitch | Direction | Overshading |
|---|---|---|---|---|
| 1 | 4.00 | 30 degrees | South | None or very little (<20 % sky blocked) |

Micro wind turbines on the building or within its curtilage

| Number of turbines | Rotor diameter (m) | Height of turbine hub above ridge of roof (m) | Terrain type |
|---|---|---|---|
| 0 | 0.000 | 0.000 | n/a |

Costs

| | |
|---|---|
| Total installed costs of system: | £10,080.00 |
| Interest rate on loan (%): | 0.000 |
| Interest added: | Yearly |
| Assessment period (years): | 25.0 |
| Unit price of electricity (p/Kw.h): | 11.460 |
| Export tarrif (p/Kw.h): | 3.100 |
| Feed-in tarrif (p/Kw.h): | 21.000 |
| % of generation used with-in the dwelling: | 50.000 |
| Panel degredation over 30 years (%): | 80.000 |
| System losses (%): | 20.000 |
| Inflation rate (%): | 4.000 |
| Energy inflation rate (%): | 9.000 |

4

5

**PV Systems**

The performance of solar PV systems is impossible to predict with certainty due to the variability in the amount of solar radiation (sunlight) from location to location and from year to year. This estimate is based upon the Government's standard assessment procedure for energy rating of buildings (SAP) and is given as guidance only. It should not be considered as a guarantee of performance.

**Wind & Turbine Systems**

This energy performance estimate is based upon a standardised method using publicly available information. It is given as guidance only and should not be considered to be a guarantee. The energy performance of wind turbine systems is impossible to predict with a high degree of certainty due to the variability in the wind from location to location and from year to year.

For a greater level of certainty, it is recommended that on-site wind speed monitoring is undertaken ideally for at least a year. Note: it may be useful to monitor for shorter periods, especially if the acquired data is then correlated with other sources in order to estimate an annual mean wind speed.

Figure 4.3: The first page of the payback print-out

3. The results summary, including the payback period.
4. The input data, including the financial assumptions.
5. The PV and wind turbine disclaimers required by the MCS.

- Page 2 shows the electricity generation graph.
- Page 3 shows the payback graph.

You can customise print outs by adding your contact details and a company logo: this is explained in section 3.10. You can also change the font used on the print out: on the **File** menu, click **Font** and make the changes in the **Font** dialogue box.